EXPRESSBOX 2400

User Manual

PCIe to PCIe Expansion

Model
EB2400

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Preface

Advisories

Five types of advisories are used throughout this manual to provide helpful information, or to alert you to the potential for hardware damage or personal injury.

NOTE
Used to amplify or explain a comment related to procedural steps or text.

IMPORTANT
Used to indicate an important piece of information or special “tip” to help you

CAUTION
Used to indicate and prevent the following procedure or step from causing damage to the equipment.

WARNING
Used to indicate and prevent the following step from causing injury.

DANGER or STOP
Used to indicate and prevent the following step from causing serious injury or significant data loss

Disclaimer: We have attempted to identify most situations that may pose a danger, warning, or caution condition in this manual. However, Magma does not claim to have covered all situations that might require the use of a Caution, Warning, or Danger indicator.

Safety Instructions

Always use caution when servicing any electrical component. Before handling the Magma Expansion chassis, read the following instructions and safety guidelines to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section for advisory conventions used in this manual, including the distinction between Danger, Warning, Caution, Important, and Note.

- Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics personnel should access the interior of the computer and expansion chassis.

WARNING
Never modify or remove the radio frequency interference shielding from your workstation or expansion unit. To do so may cause your installation to produce emissions that could interfere with other electronic equipment in the area of your system.

When Working Inside a Computer

1. Before taking covers off a computer, perform the following steps:
2. Turn off the computer and any peripheral devices.
3. Disconnect the computer and peripheral power cords from their AC outlets or inlets in order to prevent electric shock or system board damage.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to systems boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION
Do not attempt to service the system yourself except as explained in this manual. Follow installation instructions closely.

Protecting Against Electrostatic Discharge

Electrostatic Discharge (ESD) Warning
Electrostatic Discharge (ESD) is the enemy of semiconductor devices. You should always take precautions to eliminate any electrostatic charge from your body and clothing before touching any semiconductor device or card by using an electrostatic wrist strap and/or rubber mat.

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedures to reduce the risk of damage to components. Magma strongly encourages you to follow proper ESD procedures, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's anti-static packaging material until you are ready to install the component in a computer. Just before unwrapping the anti-static packaging, be sure you are at an ESD workstation or are grounded.
- When transporting a sensitive component, first place it in an anti-static container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use anti-static floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.

Chapter 1 ExpressBox 2400

Precision engineered to Magma's mission critical standards for performance and reliability, ExpressBox 2400 features seven (7) full-length, full-height PCIe slots and all connected through PCIe Gen 2. Designed with your work station in mind, the EB2400 has a rack-mountable steel chassis, a 540-watt power supply, auxiliary power, and features Magma's exclusive quiet cooling control.

The ExpressBox 2400 Expansion is compatible with a series of operating systems including MacOS, Windows, and Linux

- Seven (7) available full length/full height PCIe expansion slots
- Tool-less cover removal
- White power-on indicator front panel light
- Two 92 x 92 x 25 mm Fans
- Variable speed adjustable fan control option (or full speed)
- Speeds up to 8 GT/s (PCIe x8 Gen 2)
- Connect PCI Express Host to Expansion over cable
- Use same PCIe interface card for both sides of the connection

EXPRESSBOX 2400 PCI Express

Product Name	Description
ExpressBox 2400	7 Slot – Expansion Gen 2

Use Magma's PCI Express Expansion to create a super-fast PCIe connection outside the computer
The ExpressBox 2400 is the perfect solution for creating a super-fast local PCIe connection from a host computer to a target PCI Express device. The Magma 01-04978-03 interface card installs into any x8 or x16 PCIe slot in the host computer motherboard and the other Magma 01-08003-00 interface card is inserted into a designated upstream PCIe slot.

Features:

- High-speed x8 PCI Express connection.
- Easy Plug and Play installation.
- Low profile bracket provides for easy installation in low profile computers.
- Easily visible LEDs that indicate correct installation and PCIe link width.
- Low power consumption - less than 4 Watts
- LEDs show status of connection for quick debug- reset indicator, clock indicator, link width indicator.
- Supports Spread Spectrum Clocking, LOS (Loss of Signal), LOL (Loss of Lock Indicator).
- Low Latency and Low Jitter.
- 540 Watt Power Supply.
- Auxiliary Power Cable.

Benefits:

- Attach PCIe Cards to any Computers
- Extension of PCI Express signal outside the computer
- Daisy-chain or end-point device.
- Transparent extension of PCI Express signals outside the computer.
- No software required - connection is automatically recognized and configured by system BIOS.
- Attach large power hungry PCI Express cards to computer with limited card space.
- Low latency PCIe connection between host and target without using bridges or switches.
- Same PCIe card used for both the host and expansion device.
- Interface Card can be used with any PCIe compliant expansion chassis – Magma.
- Automated x1, x4 and x8 link negotiation for PCI Express Gen1, Gen2 and Gen 3
- Ability to override automatic PCIe link training through dip-switch settings

ExpressBox 2400 PCI Express Specifications

Item	Description
Technology	PCI Express Bus Specification Revision 2.0 PCI Local Bus Specification Revision 2.3 PCI Bridge Architecture Revision 1.2
Backplane	Available full length/full height expansion slots, X8 PCIe Gen 2.0 Electrical - x8 PCIe Physical – x16 PCIe
PCIe Link Cards	Form Factor: X8 PCIE, low Profile, half length LED Indicators: PCIe Link width, reset clock
Interconnect Bandwidth	PCIe Gen 2 | 8 GT/s to all peripherals and host link
Physical Characteristics	Length 139.7mm (5.5 inches) Width 12.7mm (0.5 inches) Height 69.9mm (2.75 inches)
Cable	3-meter PCIe cable
Enclosure	6U Steel & Aluminum | Powder Coat 14.25" Wide x 3.48" High x 17" Deep (363mm x 88.4mm x 432mm) Weight: 10.60 lbs Tool-less cover removal White power-on indicator front panel light
System Cooling	Two 92 x 92 x 25 mm | CFM:15.7-54.8 Speed: Wide PWM fan speed range between 800-2800 RPM Noise: 17-35 dBA Adjustable Fan control
Power Supply Options	540 W 100-240V, 50-60Hz Power Input Four 4-pin Molex Connector Two 6-pin + PCIe connector Input Frequency: 50-60Hz DC Output: 540 Watts Max +12V 45A -12V .5A +5V 24A +3.3V 24A +5Vsb 3.0A Combined O/P of +3.3V and 5V is 150W
Environmental	Ambient Temperature 0° to 50° C Storage Temperature -40° to 125° C Relative Humidity 5% to 85% non-condensing
MTBF	35k hours
Regulatory Compliance	FCC Class A Verified CE RoHS Compliant
Supported Operating Systems	MacOS 10.6.8 or higher, Windows 7 and Windows 8, Linux.
Warranty	30 day money back guarantee. 1 Year Return to factory

Pre-Installation Information

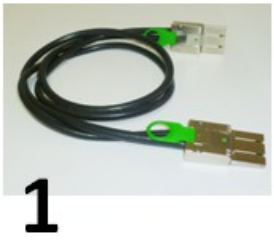
Before using the Magma Expansion chassis you should perform the following steps:

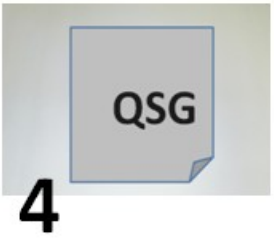
- Inventory the shipping carton contents for all of the required parts
- Gather all of the necessary tools required for installation
- Read this manual

Part List

ITEM#	DESCRIPTION	QTY
1	3-meter Ipass cable	1
2	Host Interface Card	1
3	Power Cord	1
4	QSG (Quick Start Guide)	1

ExpressBox 2400 (7 Slot – Gen2)





This model cannot be connected to a laptop. It uses a high speed PCIe cable that plugs into a Host Interface card which is installed in a PCIe slot of a motherboard Host Computer (Desktop, PC, Workstation, Sever, and similar form factors).

Components of ExpressBox 2400

Once you've completed your inventory, your next step is to get familiarized with components of the Magma ExpressBox 2400 expansion unit.

The expansion unit is composed of the following integral components.

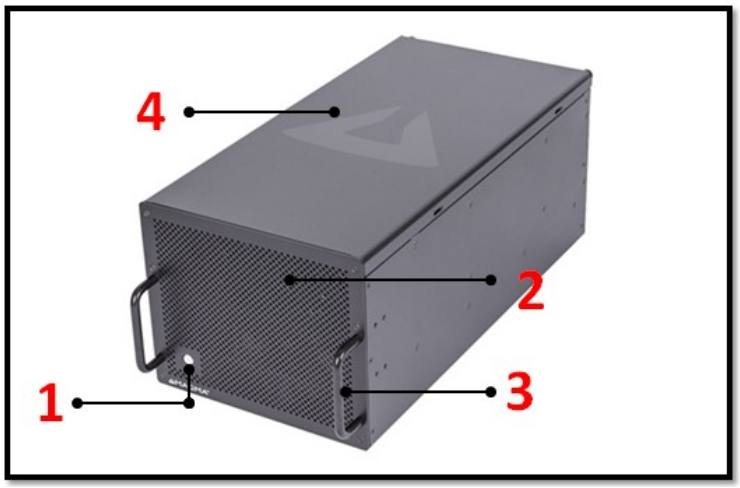
1. Expansion Backplane
    a. 7 PCIe slots (x8 electrical and x16 mechanical)
    b. One designated Link-Up slot for Interface card
    c. Slot LEDs, Link and Activity LEDs
2. Interface card
    a. Expansion and Host mode DIP switch
    b. Speed Toggle switches
    c. One Cable port (x8)
3. Power Supply
    a. Power cord socket
    b. On/Off Switch
    c. PCIe Aux power cable connectors
4. Fan s
    a. 92 x 92 x 25 mm
    b. 15.7 min to 54.8 max CFM
    c. Locking Thumb screw
    d. Air Flow: outside to inside

Front panel:

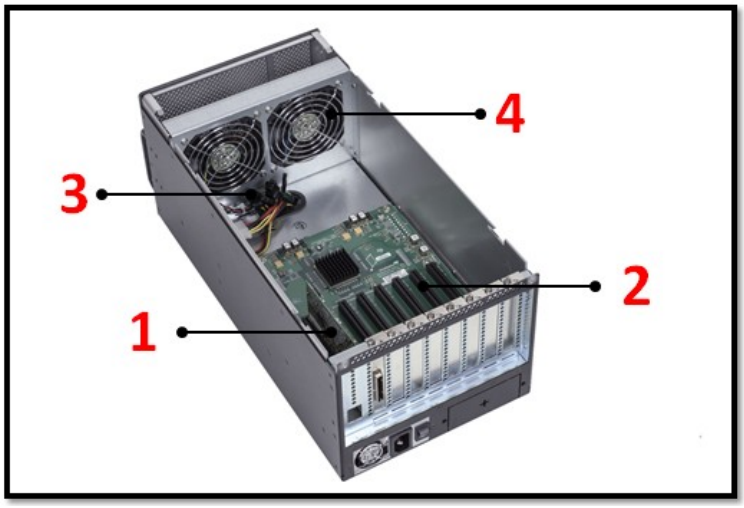
1. Front Panel Status LED
2. Front Air Ventilation cover
3. Two front Handles

Rear Panel:

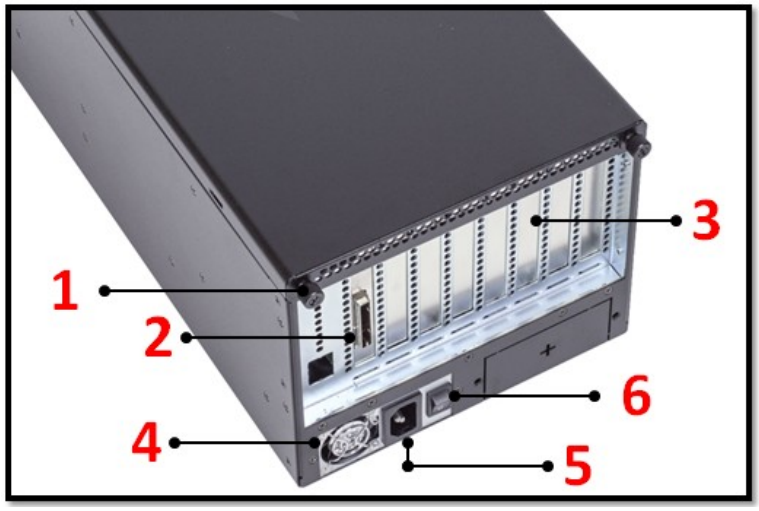
1. PCI Express card slot opening
2. Interface card cable ports
3. Power Supply (Power Cord & On/Off Switch)
4. Top cover Thumb Screws
5. Ipass Cable Port
6. Serial number



Item	Description
1	Front Led - On / Off Switch
2	Air Ventilation
3	Front Handles
4	Top Cover



Item	Description
1	Expansion Interface Card
2	PCIe Slots
3	Aux. Power Cables
4	Front Fans



Item	Description
1	Thumb Screws
2	Ipass Cable Port
3	Card Slot Opening
4	Power Supply
5	Power Cord Socket
6	PSU On / Off Switch

Tools Required for Installation

To complete the installation of the Magma product you will need a Phillips-head screwdriver and ESD wrist strap to prevent electrostatic discharge.

Chapter 2 Hardware Installation

The following steps will guide you through the installation of your Magma Expansion System.

CAUTION
Hardware installation shall be performed only by qualified service personnel.

Electrostatic Discharge (ESD) Warning
All add-in cards are susceptible to electrostatic discharge. When moving cards, it is best to carry the cards in anti-static packaging. If you need to set a circuit card down, be sure to place it inside or on top of an anti-static surface. For more information, see "Protecting Against Electrostatic Discharge" in the Preface.

WARNING
High voltages are present inside the expansion chassis when the unit's power cord is plugged into an electrical outlet. Disconnect the power cord from the AC outlet before removing the enclosure cover. Turning the system power off at the power on/off switch does not remove power to components. High voltage is still present.

CAUTION
Before touching anything inside the enclosure, move to an ESD station and follow proper ESD procedures. Failure to do so may result in electrostatic discharge, damaging the computer or its components. For more information, see "Protecting Against Electrostatic Discharge" in the Preface.

Installation-Procedures Overview

Below is the concise version on how to set up the ExpressBox 2400.

1. Open Enclosure
2. Install Expansion Interface card (If not installed)
3. Install Host Interface card into host computer
4. Connect Cable
5. Install PCIe cards (see notes below)
6. Attach Power Cord
7. Connect to Electrical Outlet
8. Power on Computer
9. Hardware Check
10. Verify Installation (via Operating System)

NOTE
It is highly recommended to install any 3rd party or High Power PCIe cards after you have verified and tested that the Magma expansion chassis is functional.

When installing 3rd Party PCIe cards, start with one card first just to see if there are any software and / or hardware issues or incompatibility problems that may occur. This way you can troubleshoot the problem more easily and efficiently. If everything works well and there are no configuration issues, you can proceed with the installation of the remaining 3rd party PCIe cards.

Always refer to "3rd party manufacturer installation guide" for further instructions.

Open Enclosure (STEP 1)

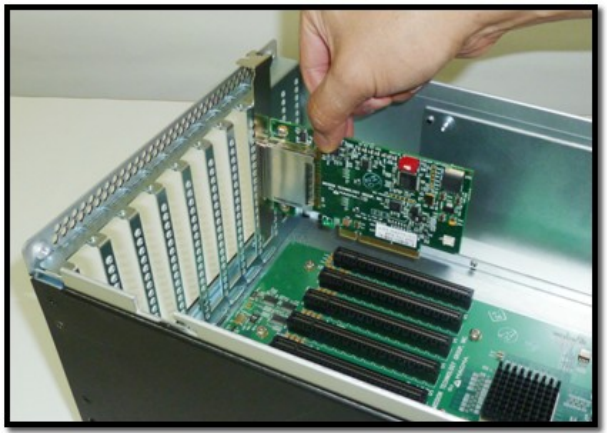
Loosen the thumbscrews that retain the top cover of the chassis and slide the lid towards you as shown from the pictures below:

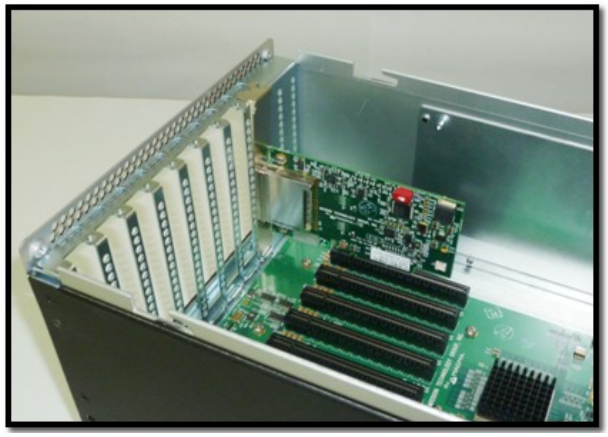
Install Expansion Interface card (STEP 2)

By default the Expansion Interface card is already installed. No need to install the Expansion Interface card.

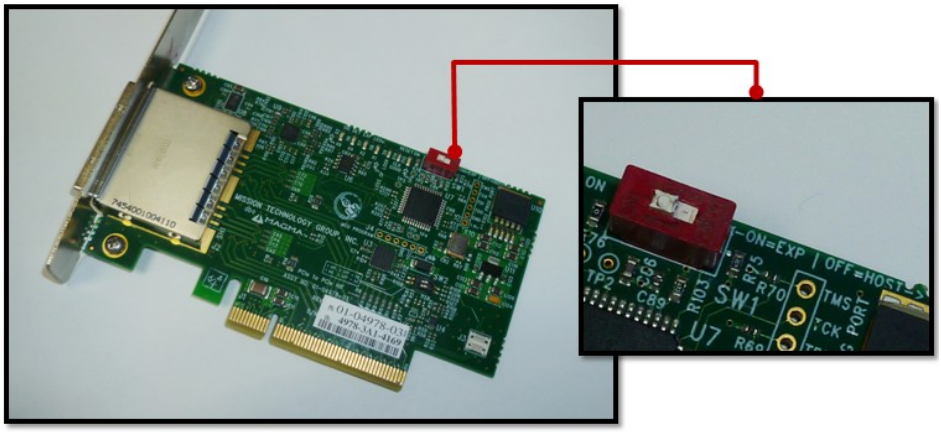
If you need to replace the Expansion Interface card or install a new Expansion Interface card follow these steps below:

1. Turn off the Expansion chassis first. Disconnect the power cord.
2. Unscrew the Expansion Interface card.
3. Install the new Expansion Interface card.
4. Plug-in the Expansion Interface card into PCIe slot#0. This is the designated slot for the Interface card. Installing the Interface card into a non-designated slot can cause the system to malfunction.

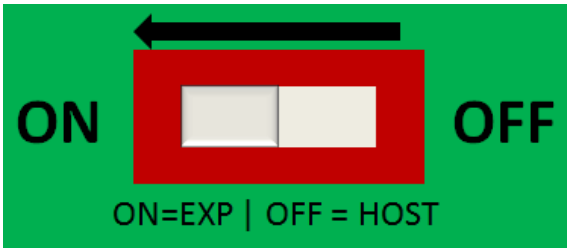




NOTE
The SW1 switch on the Expansion Interface card is set to "ON=EXP." The expansion system will NOT function if SW1 is set to OFF=HOST. See picture below for SW1 dip switch setting.



Make sure to check that the dip switch (SW1) is set to proper configuration. The toggle switch should be set to "ON=EXP" position, see picture below.



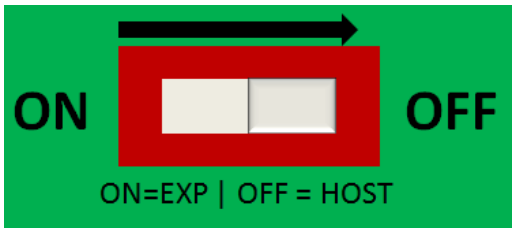
Install Host Interface card (STEP 3)

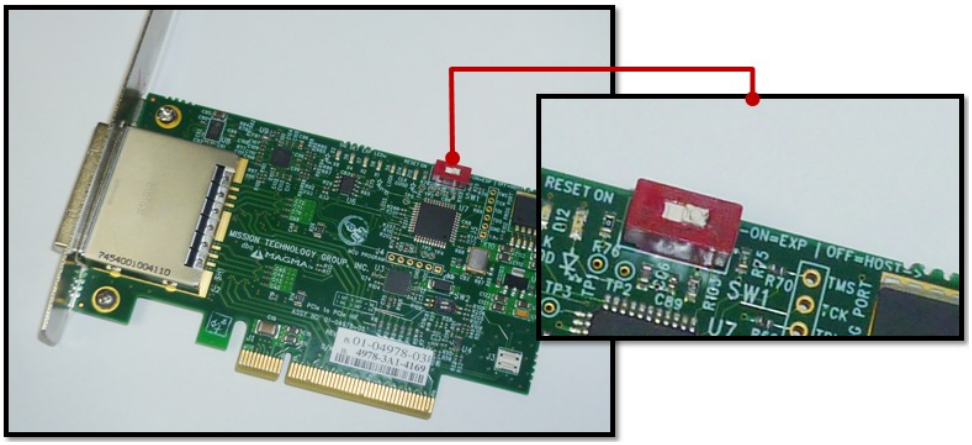
Begin the installation of your Host Interface card by first powering down your computer.
The Host Interface card is a "half-height," x8-capable PCIe card mounted to a "full-height" bracket.

For low profile case applications, you may need to change the mounting bracket to the low profile bracket that shipped with your system. This is done by removing the screws that hold the card to the bracket. Be sure you are using proper ESD procedures when completing this action.

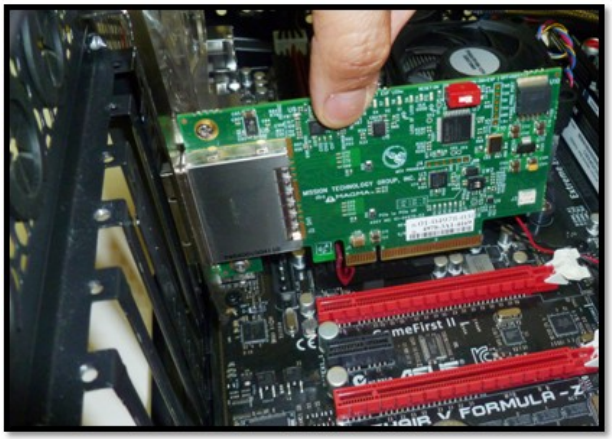
WARNING
You must only install the Host Interface card into a PCI EXPRESS SLOT.
Only use Interface card WITH bracket. This will ensure that your PCIe host card can only be inserted into a PCIe slot. Although a Host Interface card without brackets may fit into conventional PCI slots, you run the risk of damaging the PCI Express host card if you insert it into a PCI slot.

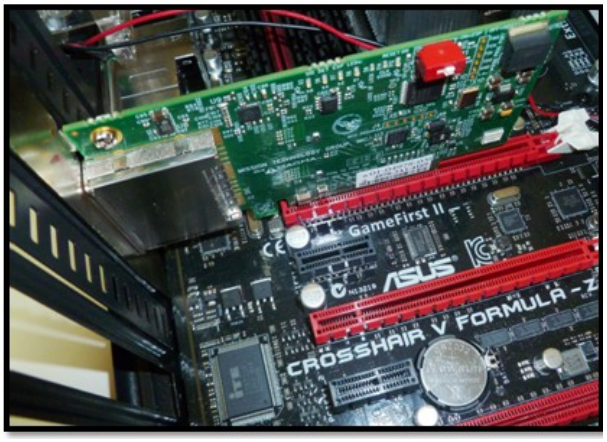
1. Once the host computer is turned OFF and power cord is disconnected from the AC outlet, remove the cover.
2. Check the red DIP switch (SW1) on the Interface card, make sure it is set to "OFF= HOST".





3. Insert the Host Interface card into a vacant x8 (or x16) PCIe slot by gently pushing the card until it is firmly seated. Then secure the card into the slot with a mounting screw.





It is important to know how many lanes the host computer slot can support. The Host Interface card does not need to be configured for the same number of lanes as the host computer slot. The Host Interface Card will train down to whatever the PCIe slot speed is that it detects.

For example, if the Host Interface Card is installed in a X4 lane card slot; leave the Host Interface Card setting as is. The host computer dictates what link width and speed the expansion system will operate in.

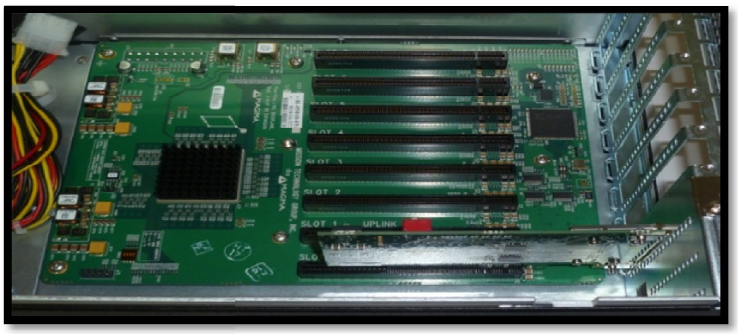
Install PCIe Cards (STEP 4)

Remove slot covers and install PCIe cards.

Make sure that all cards are fully seated in their PCIe card slots. When correctly seated, there will be a firm resistance when you pull up gently on the card. To keep the cards in place, secure them in the enclosure with their retaining screws. After securing the cards verify that they do not touch each other.

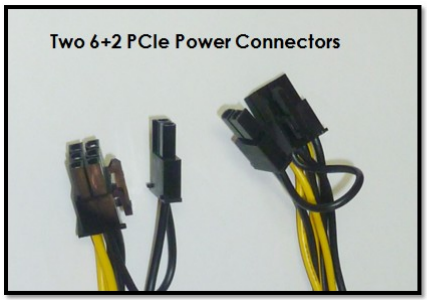
Some card manufacturers recommend that you install their software driver first prior to installing the card. If this is the case, be sure to install the card driver before connecting EXPRESSBOX 2400 to the computer.

- Slot 7 accepts all types of PCIe cards x1, x2, x4, x8 or x16.
- Slot 6 accepts all types of PCIe cards x1, x2, x4, x8 or x16.
- Slot 5 accepts all types of PCIe cards x1, x2, x4, x8 or x16.
- Slot 4 accepts all types of PCIe cards x1, x2, x4, x8 or x16.
- Slot 3 accepts all types of PCIe cards x1, x2, x4, x8 or x16.
- Slot 2 accepts all types of PCIe cards x1, x2, x4, x8 or x16.
- Slot 1 accepts all types of PCIe cards x1, x2, x4, x8 or x16.



Aux Power Connectors

Some PCIe cards require extra power. The ExpressBox 2400 power supply provides the following power connectors / adapters (see pictures below). There are three 4-pin Molex AUX power connectors that can be used for providing extra power to cards. And two (6+2 pin) PCIe connectors for GPUs.

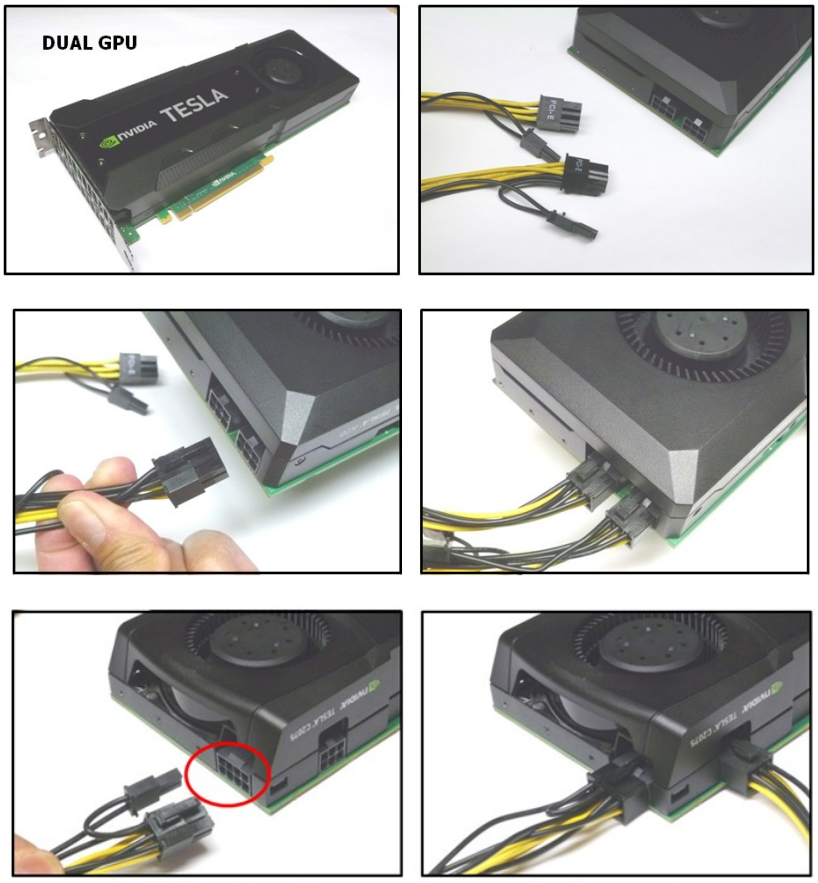


High Power PCIe card installation

High Power PCIe cards, also known as High End PCIe cards, such as GPUs and other similar types of cards require additional power (or AUX Power) to operate. High power PCIe cards or GPUs that require auxiliary power should come with power adapter cables.

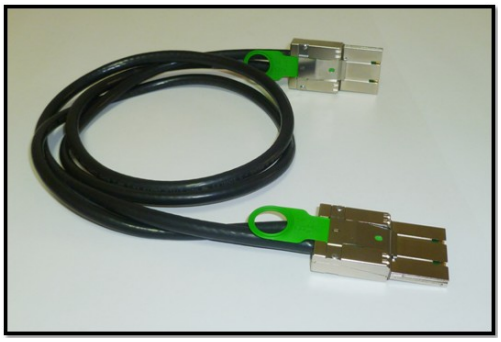
There are three 4-pin Molex AUX power connectors and two (6+2 pin) PCIe connectors from the power supply that can be used to provide power to your GPUs or High Power PCIe cards.

Other High power PCIe cards may use different Aux power adapter connectors. Use the correct power adapter for your PCIe cards.



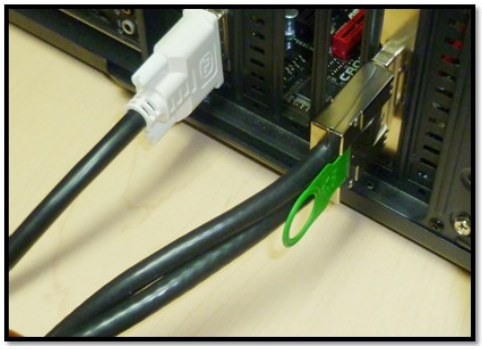
Other GPUs or PCIe cards may require the use of 8 pin connectors.

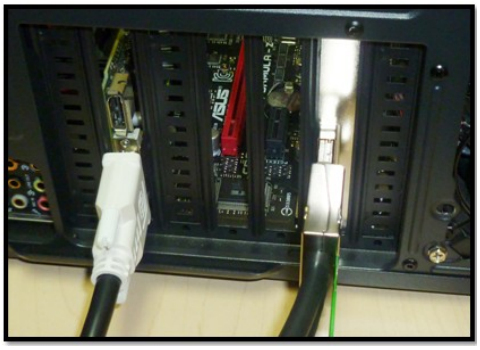
Connect Ipass Cable (STEP 5)



Connect one end of the Ipass cable to the back of the Magma expansion unit.

Connect the other end of the PCIe cable to host computer (x8 port), see pictures below.





Electrostatic Discharge (ESD) Warning
The PCIe cables are high performance communication cables and as such are sensitive to electrostatic discharge (ESD). Use appropriate anti-static precautions and packaging when handling the cables or when performing installation and/or maintenance

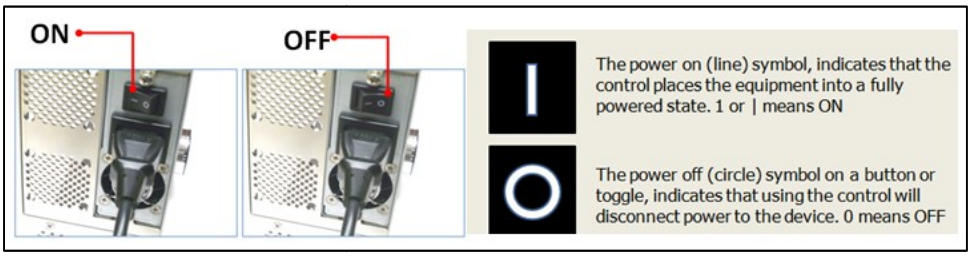
To Disconnect Cable

1. Pull the green tab while slowly pulling out the cable from the interface card.
2. Failure to pull the green tab while disconnecting the cable can break the connector inside the Interface card.

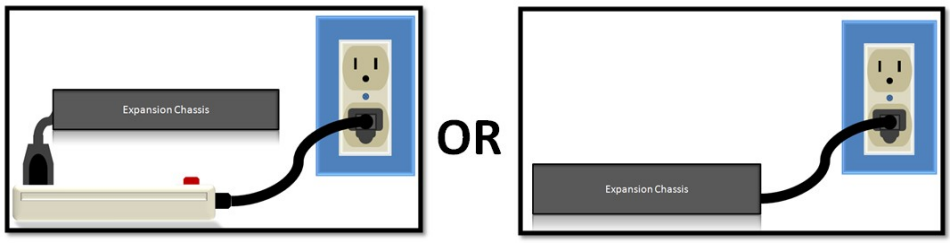
Attach Power Cord (STEP 6)

NOTE
If at all possible, plug the power cord from the expansion chassis and your host computer into a shared power strip, preferably one that has surge and noise suppression circuitry built into it.

1. Make sure the Power Switch is turned OFF first before connecting the power cord to ExpressBox 2400.
2. Turn power supply switch to ON position.


ON
OFF
The power on (line) symbol, indicates that the control places the equipment into a fully powered state. 1 or | means ON
The power off (circle) symbol on a button or toggle, indicates that using the control will disconnect power to the device. 0 means OFF

Connect to Electrical Outlet (STEP 7)



Be cautious, practice safe and correct methods when powering up your expansion unit. Before powering ON the system make sure all PCIe cards are seated properly into the card slots.

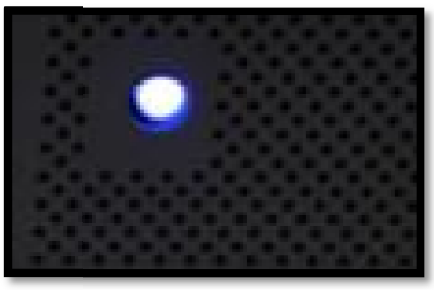
Turn ON Expansion Unit (STEP 8)

The Expansion Interface card supports remote power on. When powering up the computer it will automatically turn on the chassis. Make sure the Ipass cable is firmly attached to both Expansion chassis and Host computer . Otherwise, the chassis will not power up if cable is loose or not seated correctly.

Press the front On/Off switch to turn the expansion unit ON.

Power ON the Computer (STEP 9)

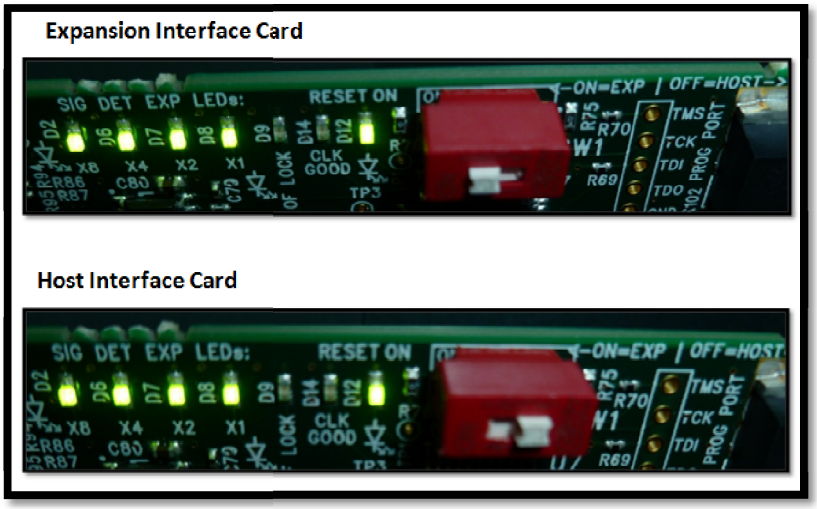
Power upthe computer. A white light located on the front panel will shine when the expansion chassis is ON. ExpressBox 2400 will automatically turn ON when the computer is turned ON.

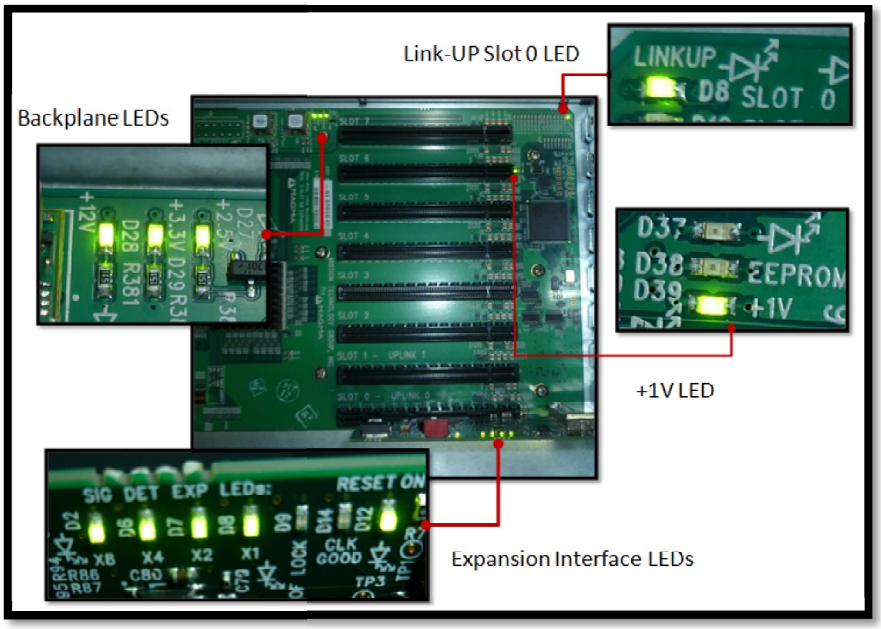


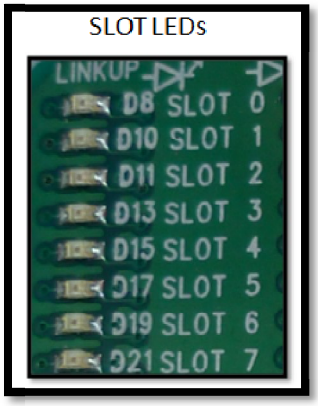
Hardware Check (STEP 10)

Once you have installed the Interface cards correctly and both computer and expansion chassis are powered up, the next step is to check the LED LINKUP status. Verify that the following LEDs on the Expansion and Host Interface cards are ON. Host and Expansion cards with a proper link established should show up with 5 solid green LEDs.

1. A working unit comes up with following LEDs illuminated:
    a. Five green LEDs on the Expansion Interface card.
    b. Five green LEDs on the Host Interface Card.
    c. Three green LEDs on the backplane.
    d. One green LED on Link-Slot 0 (If there are no 3rd Party PCIe cards installed in the slots). Or seven green LEDs if all seven PCIe slots are populated with PCIe cards.







SLOT#	When LED is ON	When LED is Off
SLOT 0	There's a link between computer and expansion unit	No connection or link between computer and expansion unit
SLOT 1	When there is a PCIe card in the slot and it is being recognized by the PCIe switch (of the Expansion unit)	No PCIe card in the card slot
SLOT 2	When there is a PCIe card in the slot and it is being recognized by the PCIe switch (of the Expansion unit)	No PCIe card in the card slot
SLOT 3	When there is a PCIe card in the slot and it is being recognized by the PCIe switch (of the Expansion unit)	No PCIe card in the card slot
SLOT 4	When there is a PCIe card in the slot and it is being recognized by the PCIe switch (of the Expansion unit)	No PCIe card in the card slot
SLOT 5	When there is a PCIe card in the slot and it is being recognized by the PCIe switch (of the Expansion unit)	No PCIe card in the card slot
SLOT 6	When there is a PCIe card in the slot and it is being recognized by the PCIe switch (of the Expansion unit)	No PCIe card in the card slot
SLOT 7	When there is a PCIe card in the slot and it is being recognized by the PCIe switch (of the Expansion unit)	No PCIe card in the card slot

Chapter 3 Software Installation

IMPORTANT
Magma requires no driver for Windows, Mac OS, Linux and other Operating Systems.

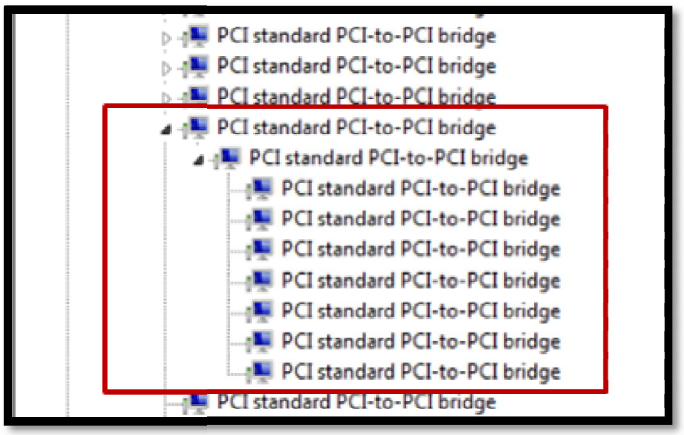
Software Check - Verify Installation (STEP 11)

Check Magma Device - Windows 7 and 8

Open ACPI (BIOS) **à** Open PCI Bus **à** Click the '+' sign several times until your reach a PCI Express Root Port or PCI Standard PCI-to-PCI Bridge with a PCI Standard PCI-to-PCI Bridge beneath it. If the verification is

successful, you can install 3rd Party cards as well as auxiliary peripherals, such as hard drives into the chassis. If, however, the installation was unsuccessful, you may not see the PCI to PCI Bridge, or it will have a small yellow symbol in front of it.

The first instance of PCI standard PCI-to-PCI Bridge is the Host Interface card device.
The second PCI standard PCI-to-PCI Bridge is the Expansion Interface card device.
Beneath the second PCI standard PCI-to-PCI Bridge are seven instances of PCI standard PCI-to-PCI Bridges, these are the seven PCIe slots.



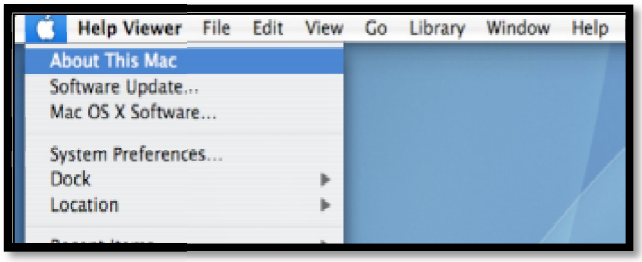
To check the Magma Device ID

Right Click on the PCI standard PCI-to-PCI Bridge, select Properties
Select the Details Tab
Under Property dropdown list select "Hardware Ids
Under Value you should see " PCI\VEN_111D&DEV_80BF&SUBSYS_00000000....

Check Magma device - Mac OS X

IMPORTANT
Magma requires no driver for Mac OS.

To verify a successful installation of Magma ExpressBox 2400 on Mac select “About This Mac” under the Apple Icon.



1. Your first step will vary depending on which version of Mac OS X you are using:

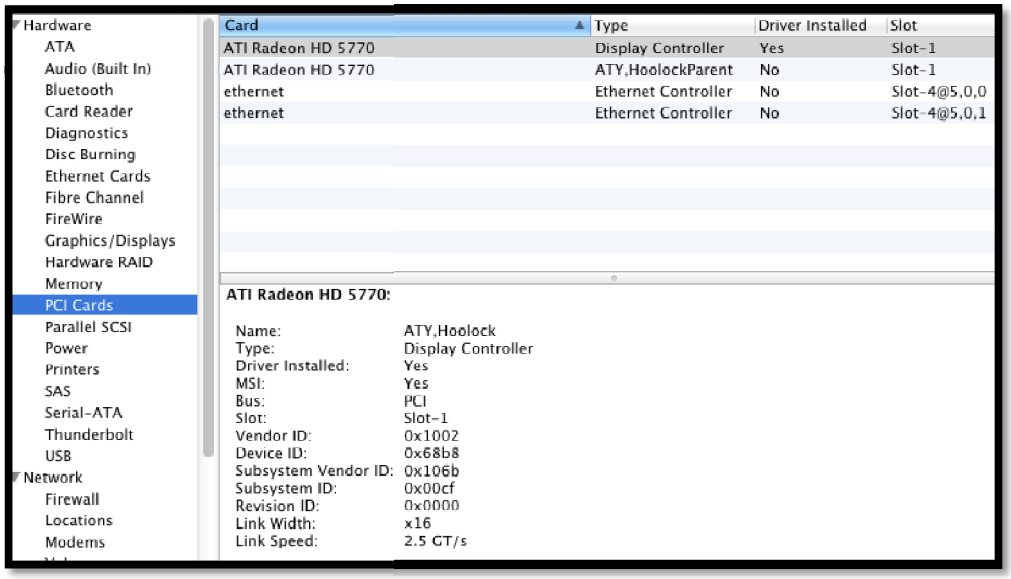
Mac OS X Snow Leopard 10.6.8 or earlier:

- Open Apple System Profiler by choosing about this Mac from the Apple ( ) menu. Then, click More Info.

OS X Lion 10.7 or later:

- Open System Information by choosing About this Mac from the Apple ( ) menu. Then, click System Report.

2. Click PCI Cards. You should see the PCIe cards installed in the Magma expansion chassis.
3. Magma devices are transparent to the Operating System. It will only show the cards installed in the expansion chassis.



Check Magma device – Linux

Once the ExpressBox 2400 expansion unit has been installed in a Linux-based system, its installation can be verified by typing the following command lines:

lspci –t Displays the overall structure of the PCIe expansion system

lspci –vv Lists additional information about the PCIe switch (in our case it will list the Integrated Device Technology (IDT) information.

lspci –vvv Displays the most comprehensive information about the expansion system.

Typical output from lspci –vvv is verbose, but you can dig through the information to find very important information. There are many registers and settings associated with PCI Express Switches.

Use the “lspci | grep “IDT” command to check that the Magma card slot devices are detected (see image below).

```
root@MAGMA:~# lspci -nnv | grep "IDT"
04:00.0 PCI bridge [0604]: Integrated Device Technology, Inc. [IDT] Device [111d:80bf]
05:01.0 PCI bridge [0604]: Integrated Device Technology, Inc. [IDT] Device [111d:80bf]
05:02.0 PCI bridge [0604]: Integrated Device Technology, Inc. [IDT] Device [111d:80bf]
05:03.0 PCI bridge [0604]: Integrated Device Technology, Inc. [IDT] Device [111d:80bf]
05:04.0 PCI bridge [0604]: Integrated Device Technology, Inc. [IDT] Device [111d:80bf]
05:05.0 PCI bridge [0604]: Integrated Device Technology, Inc. [IDT] Device [111d:80bf]
05:06.0 PCI bridge [0604]: Integrated Device Technology, Inc. [IDT] Device [111d:80bf]
05:07.0 PCI bridge [0604]: Integrated Device Technology, Inc. [IDT] Device [111d:80bf]
root@MAGMA:~#
```

How To Check PCIe cards - Mac OS X

1. Your first step will vary depending on which version of Mac OS X you are using:

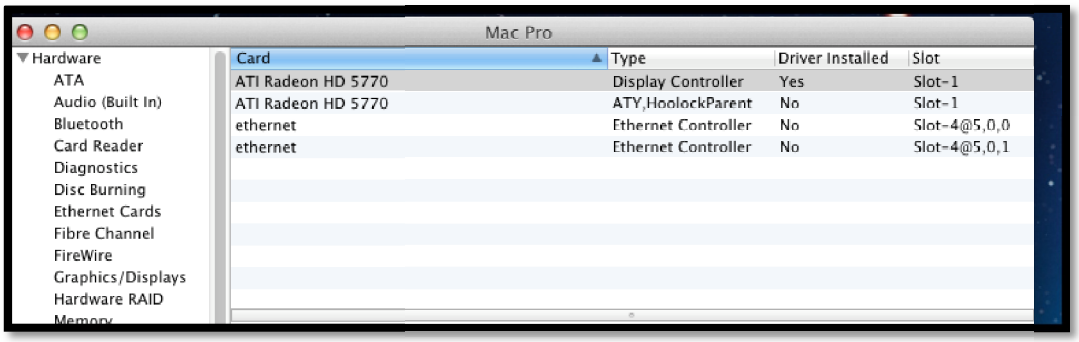
Mac OS X Snow Leopard 10.6.8 or earlier:

- Open Apple System Profiler by choosing About this Mac from the Apple ( ) menu. Then, click More Info.

OS X Lion 10.7 or later:

- Open System Information by choosing About this Mac from the Apple ( ) menu. Then, click System Report

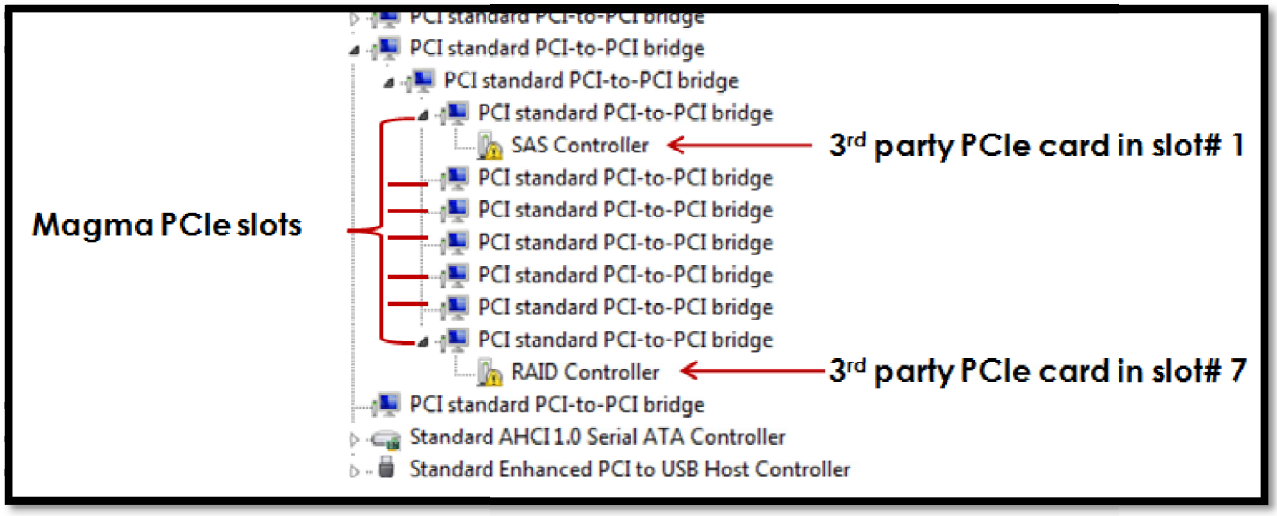
2. Click PCI cards



How To Check PCIe cards - Windows 7 and 8

No special drivers are required for Magma Expansion and Host Interface cards with Windows 7. However, you would need drivers for any 3rd Party PCIe cards that you will be using in the expansion unit. Drivers for 3rd Party PCIe cards can be obtained from the vendor or manufacturer of the PCIe cards. Magma does not provide nor supply 3rd Party drivers.

The picture below shows three 3rd Party PCIe cards appearing beneath each PCI standard PCI-to-PCI Bridge.


Magma PCIe slots
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
SAS Controller
3rd party PCIe card in slot# 1
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
RAID Controller
3rd party PCIe card in slot# 7
PCI standard PCI-to-PCI bridge
Standard AHCI 1.0 Serial ATA Controller
Standard Enhanced PCI to USB Host Controller

.

Chapter 4 Troubleshooting

Q: If the Interface card fails to power up, what should I check?

A: Make sure it is firmly seated into the PCIe card slot 0.

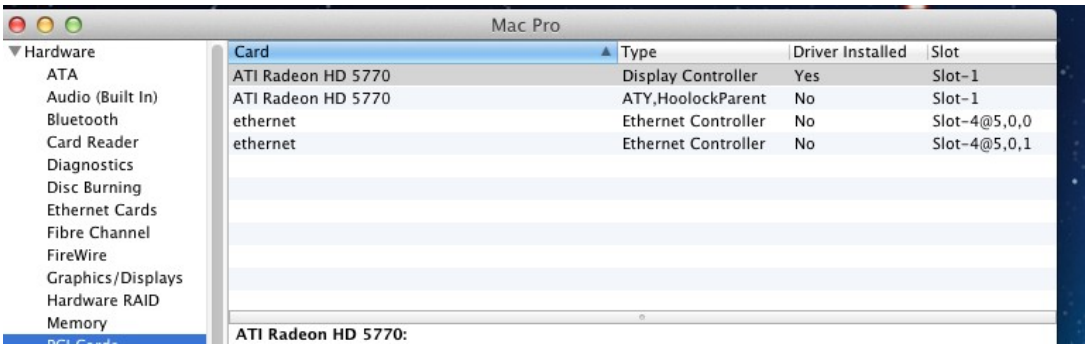
Q: How do I know if the ExpressBox 2400 power supply is working?

A: If the Interface card is properly seated and connected, there should be 3 green LEDs lit on the backplabe , 5 green LEDs lit on the Expansion Interface, and 1 green LINK UP LED should be turned ON.

Q: Will ExpressBox 2400 show up in Apple System Profiler or Windows Device Manager without any PCIe cards installed?

A: In Mac OS, the Magma ExpressBox 2400 is transparent , only PCIe cards will be shown.

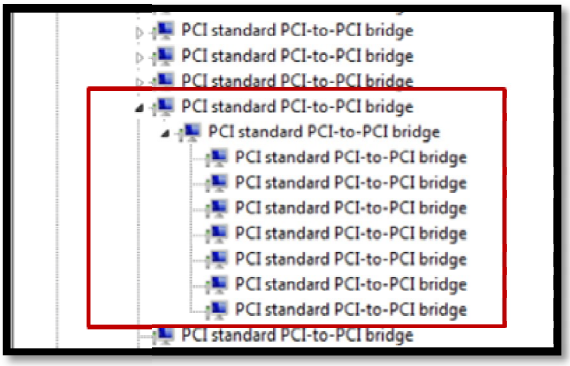
In Apple System Profiler **à** PCI Cards **à** It will show all the PCIe cards that are being detected.



In Windows Device Manager, it will show all seven PCI standard to PCI Bridge.

In Windows **à** Control Panel **à** Device Manager **à** View by connection

You should see these three PCI-to-PCI bridges. Right click on it and select “Properties”, select Hardware Ids from dropdown list, see picture below.

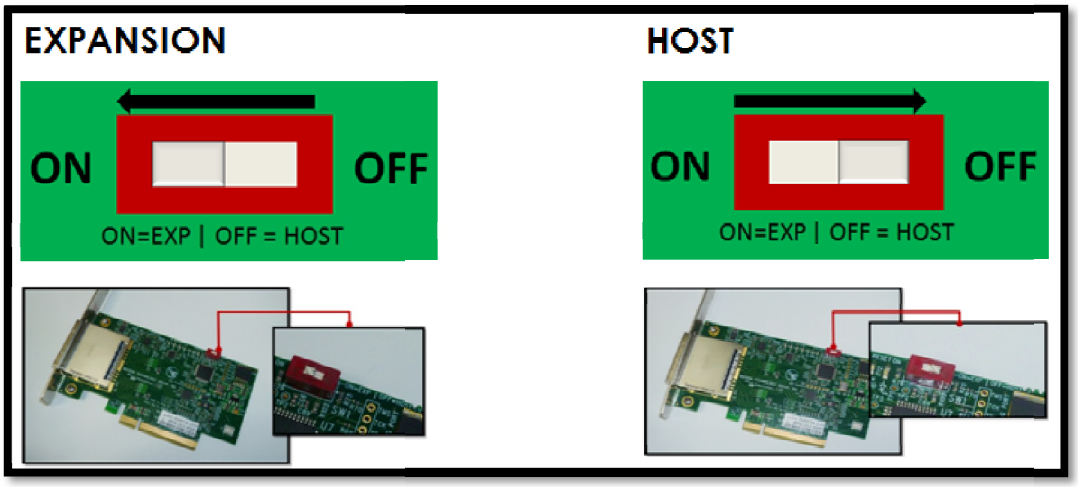


Q: My host computer is having problems linking up to the expansion chassis. I have both Interface cards installed and seated firmly in their corresponding slot; one is installed in the host computer PCIe slot and the other one in the expansion PCIe slot. Is there something wrong with the Interface card?

A: When using the 01-04973-03, which comes in a pair, one should be set to OFF-host and the other is set to ON-Exp.

1. There's a Red Dip switch on the Interface card that must be set correctly in order to work. The red dip switch is labeled SW1.
2. 01-08003-00, SW1 when set to ON=EXP should be installed only inside the Magma Expansion unit.
3. 01-08003-00, SW1 when set to OFF=HOST should be installed inside the host computer.
4. If the 01-08003-00 cards are not set properly your computer won't link up with the Magma expansion unit.

See pictures below:



Q: My computer won't boot up while the Magma ExpressBox 2400 is connected, what should I do?

A: When the computer is having problem starting up while the Magma ExpressBox 2400 is attached, it is an indication that you either have a faulty ExpressBox 2400 expansion unit or malfunctioning PCIe cards that are installed in the expansion PCIe slots.

Start removing all the PCIe cards in the chassis. Boot the computer up and see if it works.

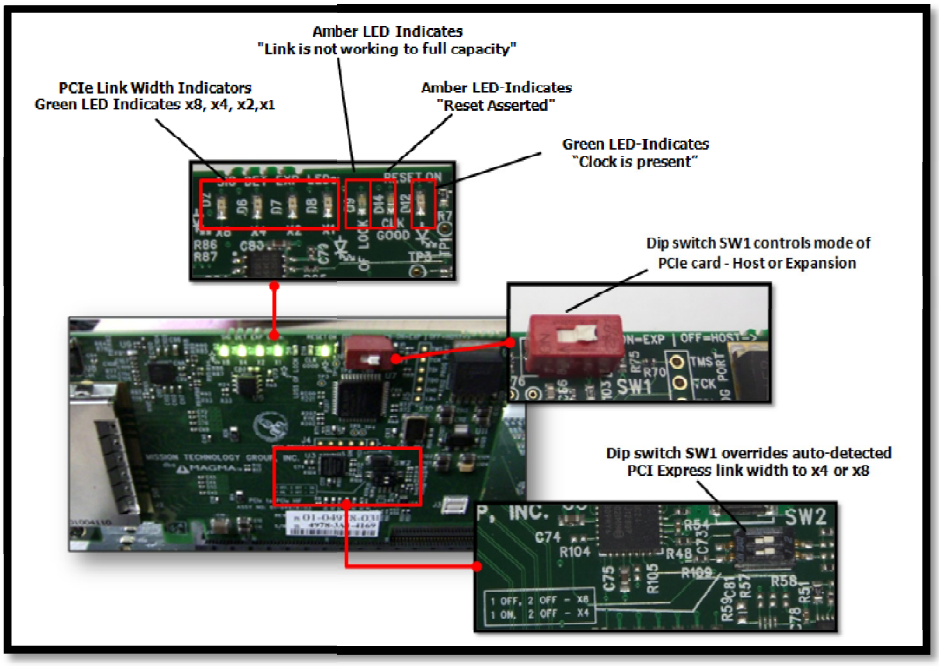
- If the computer showed no problems starting up (with PCIe cards removed), this means that the PCIe card(s) is/are causing the problem and not the expansion unit.
- If the computer is still exhibiting the same issue without any PCIe cards installed in the chassis, this means that you have a faulty Magma device or hardware.
- Start swapping the cable first. See if that fixes the problem.
- The next would be to replace the Host Interface card.
- If you are still having the same problem after replacing the Magma cable and Host Interface card, this means that you have a faulty expansion chassis.
- Inside the expansion chassis there are three major components and these are the Expansion Interface card, Backplane and Power Supply unit.

Chapter 5 Other Technical Information

Interface Card LEDs

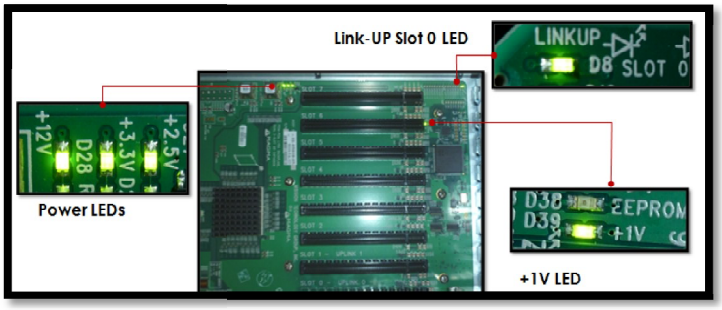
Onboard Visual Diagnostic Features

Multiple LEDs and Dip switches make debugging and troubleshooting easy. Visible LEDs show the PCIe link width that each PCIe Interface card is operating. Other LEDs for "Loss of Clock", "Reset ON", and "Clock Good" are useful visual indicators for troubleshooting and verifying the connections without expensive software diagnostic tools. A fully functional Interface card will have 5 Solid Green LEDs.


Amber LED Indicates
"Link is not working to full capacity"
PCIe Link Width Indicators
Green LED Indicates x8, x4, x2,x1
Amber LED-Indicates
"Reset Asserted"
Green LED-Indicates
"Clock is present"
Dip switch SW1 controls mode of
PCIe card - Host or Expansion
Dip switch SW1 overrides auto-detected
PCI Express link width to x4 or x8

Backplane LEDs

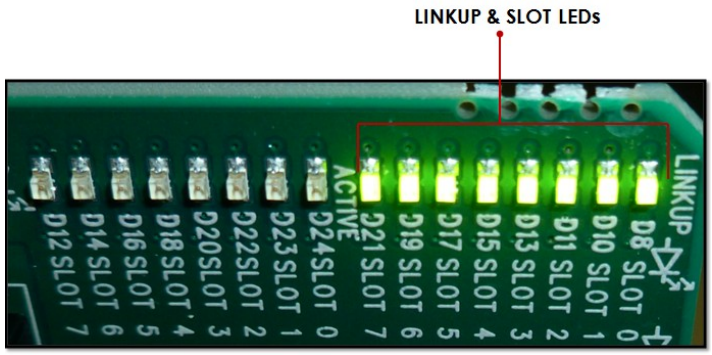
A fully operational backplane will have the +12v, +3.3v, +2.5v, +1v Solid Green LEDs illuminated including the D8 (Linkup-SLOT 0).



If you are only seeing One or Two Green LEDs that are illuminated on the Backplane after the Magma EXPRESSBOX 2400 is turned on, you may be having a power supply problem or the Interface cards are not seated properly. Or the Ipass cable is damaged or not making good contact with the Interface cards.

LINKUP & SLOT LEDs

Each PCIe slot has designated LED indicators. SLOT Link UP LED illuminates when a PCIe card is installed. When all of the PCIe slots are populated with PCIe cards all SLOT Link UP LED should come on, see picture below.

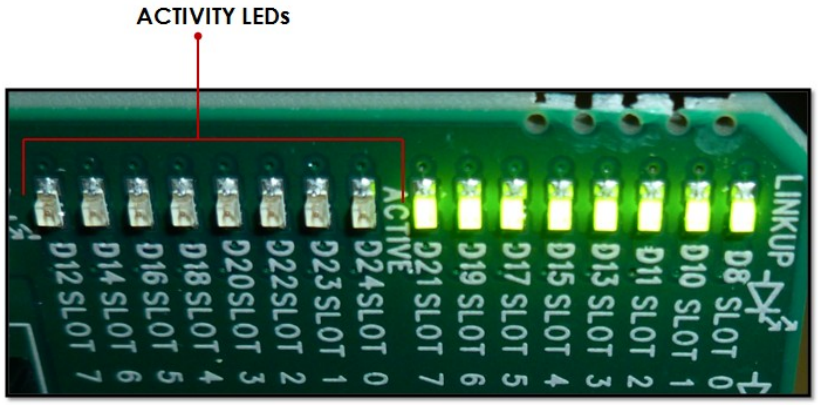


LED (LINK UP)	SLOT	Description
D8	SLOT 0	Solid green when good connectivity between the chassis and the computer is established
D10	SLOT 1	Solid green when there is a PCIe card in the slot and it is being recognized by the switch (of the expansion unit)
D11	SLOT 2	Solid green when there is a PCIe card in the slot and it is being recognized by the switch (of the expansion unit)
D13	SLOT 3	Solid green when there is a PCIe card in the slot and it is being recognized by the switch (of the expansion unit)
D15	SLOT 4	Solid green when there is a PCIe card in the slot and it is being recognized by the switch (of the expansion unit)
D17	SLOT 5	Solid green when there is a PCIe card in the slot and it is being recognized by the switch (of the expansion unit)
D19	SLOT6	Solid green when there is a PCIe card in the slot and it is being recognized by the switch (of the expansion unit)
D21	SLOT 7	Solid green when there is a PCIe card in the slot and it is being recognized by the switch (of the expansion unit)

If you have PCIe cards installed in the PCIe slot(s) and none of the Link UP LEDs are illuminated this means that you either have a defective PCIe card or the PCIe card(s) is / are not seated all the way in the PCIe slot(s).

ACTIVITY LEDs

Each PCIe slot has its own Activity LEDs indicator. When this LED comes on it signifies that the PCIe card is executing a command or being used / accessed by the application. It comes on as "solid green" and / or sometimes it blinks or flickers.



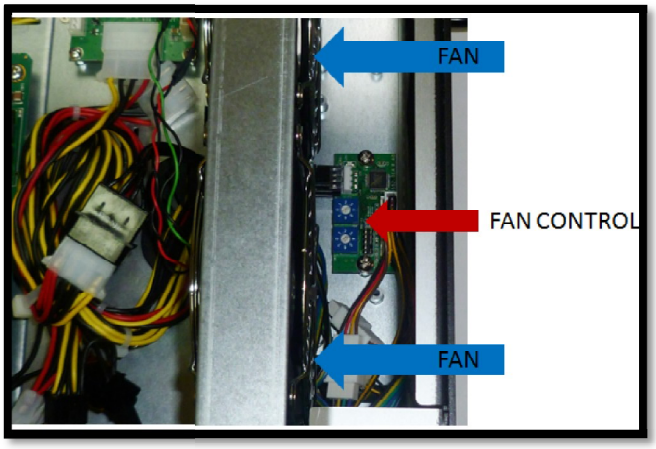
LED (ACTIVITY)	SLOT	Description
D24	SLOT 0	Flickers when the Upstream slot (Interface card) is communicating back and fort with the host computer.
D23	SLOT 1	Flashes rapidly when PCIe card is executing command or being used or accessed by the application.
D22	SLOT 2	Flashes rapidly when PCIe card is executing command or being used or accessed by the application.
D20	SLOT 3	Flashes rapidly when PCIe card is executing command or being used or accessed by the application.
D18	SLOT 4	Flashes rapidly when PCIe card is executing command or being used or accessed by the application.
D16	SLOT 5	Flashes rapidly when PCIe card is executing command or being used or accessed by the application.
D14	SLOT6	Flashes rapidly when PCIe card is executing command or being used or accessed by the application.
D12	SLOT 7	Flashes rapidly when PCIe card is executing command or being used or accessed by the application.

Internal Front Fan (Control Settings)

Some PCI Express cards produce substantial heat and must be cooled properly to eliminate over heating problem. Two Fans are located in the front of the enclosure to provide cooling required for the hottest PCI Express Cards. Some graphics cards or GPU's require these fans to be at full capacity to prevent over-heating.

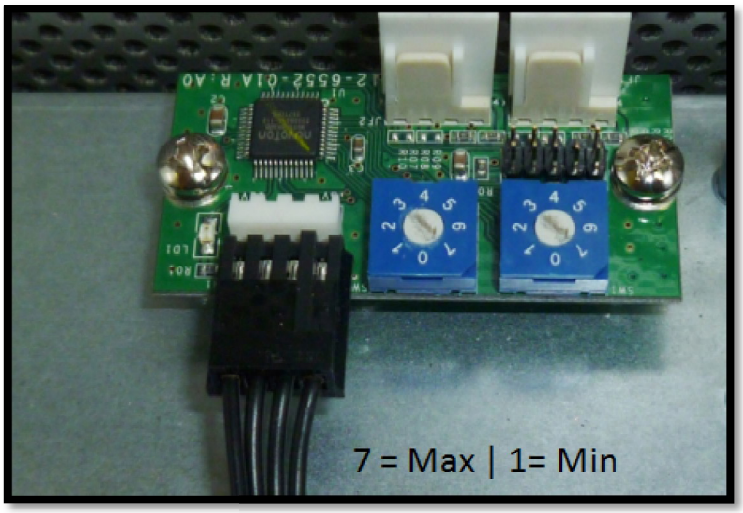
As a safety measure, Magma provides EXPRESSBOX 2400 with the fan functioning at full speed (MAX). However, noise is a concern for many applications. For noise sensitive applications, we have provided an "Adjustable Fan Control" to help alleviate fan noise in situations when a low heat producing card is installed in Magma EXPRESSBOX 2400.

The "Adjustable Fan Control" is located inside the front chassis.



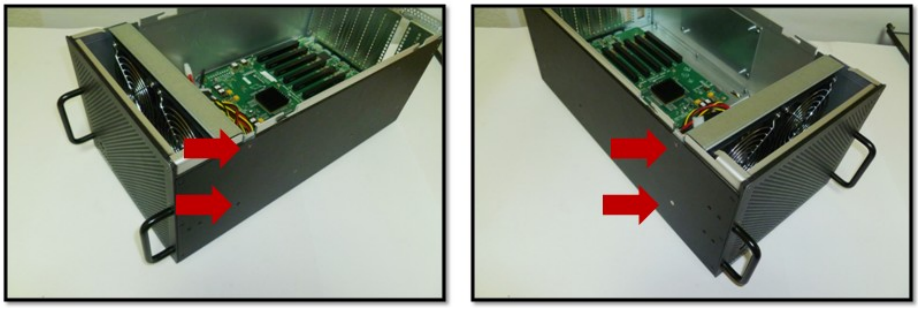
By default, the two fans will run at maximum speed when the DIP Switch is set to MAX (#7). Fans will run at minimum speed if it set #1.

To set the FAN (speed) locate the small board inside the front chassis . #7 = Fans are running at fast mode and #1= fans are running at slowest speed.

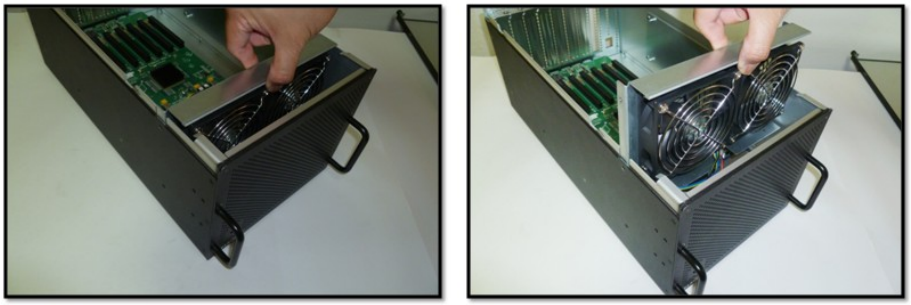


Front Fan Removal / Installation

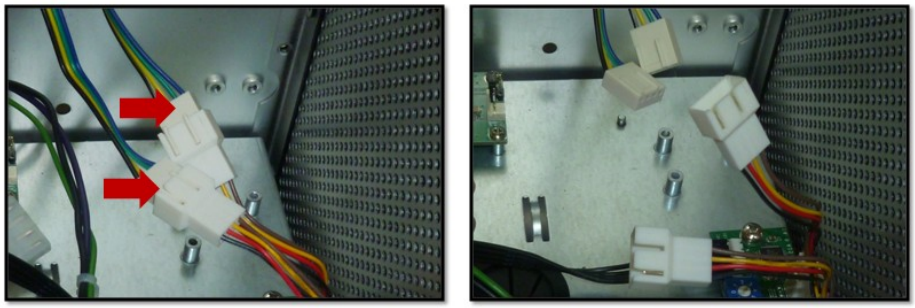
Remove the mounting screws on the side panel, see pictures below



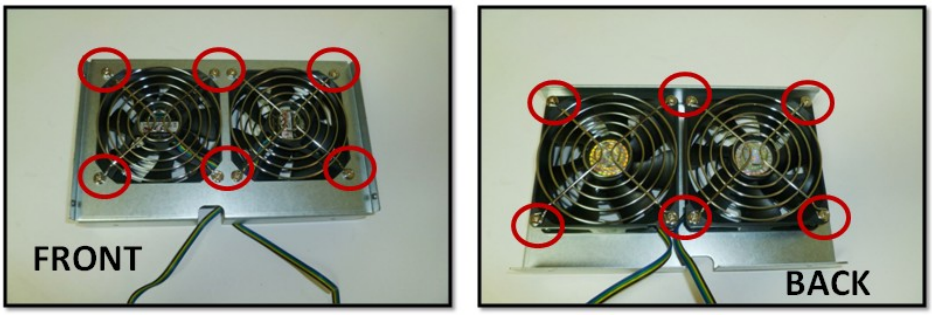
Gently pull out the Fan housing.



Disconnect the two Fan Power Cables



Remove all screws from the front.
Flip the fan housing to access the back side of the fan and remove the rest of the screws.



Chapter 6 How to Get More Help

You can visit the Magma Technical Support FAQ pages on the Internet at: www.magma.com/support/

Contacting Technical Support

Our support department can be reached by fax at (858) 530-2733 or by phone at (858) 530-2511. Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting MAGMA Technical Support make sure to include the following information:

1. Exact and correct Magma Serial #
2. Service Ticket or Case # (if you already submitted an online request)
3. Computer Type & Model: Operating System
4. Make & Model of PCI/PCIe cards: Application
5. Problem description
6. Your full name and contact number(s).

When submitting an online technical support request always provide a valid working e-mail address, phone number, shipping address and proper contact name. Check your e-mail for an automated response containing the case # and updates. You can also visit our web site at: www.magma.com/support. For a quick response, use the Technical Support and RMA Request Form available in the Support Section of the website. Simply complete the form with all required information. Please make sure that your problem description is sufficiently detailed to help us understand your problem.

Shipping or Transporting of Expansion Unit with PCI / PCIe cards

Any PCIe cards in should be removed (or not to be installed) prior to shipment to avoid or prevent possible damage. Note: Expansion board and PCIe / PCI cards that arrive damaged in shipment will not be covered under warranty.

Returning Merchandise to MAGMA

If factory service is required, a Service Representative will give you a Return Merchandise Authorization (RMA) number. Put this number and your return address on the shipping label when you return the item(s) for service. Magma will return any product that is not accompanied by an RMA number. Please note that Magma WILL NOT accept COD packages, so be sure to return the product freight and duties-paid.

Ship the well-packaged product to the address below:

Attention: RMA # _____, MAGMA
9918 Via Pasar
San Diego, CA 92126
USA

It is not required, though highly recommended, that you keep the packaging from the original shipment of your Magma product. However, if you return a product to Magma for warranty repair/ replacement or take advantage of the 30-day money back guarantee, you will need to package the product in a manner similar to the manner in which it was received from our plant. Magma cannot be responsible for any physical damage to the product or component pieces of the product (such as the host or expansion interfaces for the expansion chassis) that are damaged due to inadequate packing. Physical damage sustained in such a situation will be repaired at the owner's expense in accordance with Out of Warranty Procedures. Please, protect your investment, a bit more padding in a good box will go a long way to insuring the device is returned to use in the same condition you shipped it in. Please call for an RMA number first.

Appendix A Compliance

FCC

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE
The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interferences or to be noncompliant with the appropriate standards for its intended use.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numériqué de la classe A est conformé à la norme NMB-003 du Canada

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives. Magma will not retest or recertify systems or components that have been reconfigured by customers

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